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CLAIMS

What is claimed is:

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1. An isolated DNA comprising:
- (a) a nucleic acid sequence that encodes a polypeptide that enhances spreading of a macrophage or a monocyte and that hybridizes under highly stringent conditions to the complement of a sequence that encodes a polypeptide with an amino acid sequence selected from the group consisting of SEQ ID NO:2, SEQ ID NO:10, SEQ ID NO:12, and SEQ ID NO:18; or
- (b) the complement of the nucleic acid sequence.
2. The DNA of claim 1, wherein the nucleic acid sequence encodes a polypeptide comprising an amino acid sequence selected from the group consisting of SEQ ID NO:2, SEQ ID NO:10, SEQ ID NO:12, and SEQ ID NO:18.
3. The DNA of claim 1, wherein the nucleic acid sequence is selected from the group consisting of SEQ ID NO:1, SEQ ID NO:11, SEQ ID NO:13, and SEQ ID NO:19.
4. An isolated polypeptide comprising:
- an amino acid sequence selected from the group consisting of SEQ ID NO:10, SEQ ID NO:12, and SEQ ID NO:18; or differing from SEQ ID NO: 10, 12, or 18 solely by one or more conservative amino acid substitutions.
5. A fusion protein comprising:
- (a) an amino acid sequence selected from the group consisting of SEQ ID NO:2, SEQ ID NO:10, SEQ ID NO:12, and SEQ ID NO:18, but lacking methionine at position 1 of said amino acid sequence; and
- (b) a heterologous leader peptide.

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6. An isolated nucleic acid encoding the fusion protein of claim 5.

7. A method of enhancing spreading of a macrophage or a monocyte *in vitro*, the method comprising co-culturing a T cell and a monocyte or a macrophage with an agent selected from the group consisting of:

(a) an isolated attractin polypeptide comprising an amino acid sequence selected from the group consisting of SEQ ID NO:2, SEQ ID NO:10, SEQ ID NO:12, and SEQ ID NO:18;

(b) a functional fragment of the attractin polypeptide; and

(c) the polypeptide or the functional fragment, but with at least one conservative amino acid substitution.

8. A method of treating a mammal in need of an enhanced immune response, the method comprising delivering to a tissue of the mammal that contains T cells and macrophages or monocytes, an agent selected from the group consisting of:

(a) an isolated attractin polypeptide comprising an amino acid sequence selected from the group consisting of SEQ ID NO:2, SEQ ID NO:10, SEQ ID NO:12, and SEQ ID NO:18;

(b) a functional fragment of the attractin polypeptide; and

(c) the polypeptide or the functional fragment, but with at least one conservative amino acid substitution.

9. The method of claim 8, wherein the delivery comprises administration of the agent to the mammal.

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10. The method of claim 8, wherein the delivery comprises administering to the mammal a nucleic acid encoding the agent.

11. The method of claim 8, wherein the mammal is
5 a human.

12. The method of claim 11, wherein the human is suspected of being immunodeficient.

13. The method of claim 11, wherein the human is suspected of having cancer.

10 14. The method of claim 13, wherein the method is performed before, during, or after chemotherapy or radiation therapy.

15 15. A method of inhibiting spreading of a macrophage or a monocyte in a mammal, the method comprising administering to the mammal an isolated compound that binds to an attractin polypeptide.

16. The method of claim 15, wherein the compound is an antibody.

17. The method of claim 15, wherein the mammal is
20 a human.

18. The method of claim 17, wherein the human is suspected of having an autoimmune disease.

19. The method of claim 17, wherein the human is a transplant recipient.

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20. A vector comprising the isolated DNA of claim 1.

21. The vector of claim 20, wherein the nucleic acid sequence is operably linked to a regulatory element which allows expression of said nucleic acid in a cell.

22. A cultured cell comprising the vector of claim 21.

23. A method of producing a polypeptide, the method comprising culturing the cell of claim 22 and purifying the polypeptide from the cell.

24. A vector comprising the isolated nucleic acid of claim 6.

25. The vector of claim 24, wherein the nucleic acid is operably linked to a regulatory element which allows expression of said nucleic acid in a cell.

26. A cell comprising the vector of claim 25.

27. A method of producing a fusion protein, the method comprising culturing the cell of claim 26 and purifying the fusion protein from the cell.

28. A method of identifying a compound that inhibits an immune response, the method comprising:

a) providing an isolated polypeptide comprising an amino acid sequence selected from the group consisting of SEQ ID NO:2, SEQ ID NO:10, SEQ ID NO:12, and SEQ ID NO:18, or the amino acid sequence but with one or more conservative amino acid substitutions.

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b) co-culturing a T cell and a macrophage or a monocyte with the isolated polypeptide and the test compound;

5 c) determining whether the test compound inhibits spreading of the macrophage or the monocyte, as an indication that the test compound inhibits an immune response.

29. A method of identifying a compound that enhances an immune response, the method comprising:

10 a) providing a test compound;

b) combining the test compound, a T cell, a macrophage or a monocyte, and an isolated polypeptide comprising an amino acid sequence selected from the group consisting of SEQ ID NO:2, SEQ ID NO:10, SEQ ID NO:12, and SEQ ID NO:18, or the amino acid sequence with one or more conservative substitutions; and

c) determining whether the test compound enhances spreading of the macrophage or the monocyte, as an indication that the test compound inhibits an immune response.

30. An antibody that binds to a polypeptide selected from the group consisting of SEQ ID NO:10, SEQ ID NO:12, and SEQ ID NO:18, but that does not bind to CD26 or to a polypeptide with the sequence of SEQ ID NO:2.

31. The antibody of claim 30, wherein the antibody is a single chain variable region fragment (scFv).

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32. A method of treating a mammal in need of an enhanced immune response, the method comprising:

a) providing a recombinant cell which is the progeny of a cell obtained from the mammal and has been
5 transfected or transformed ex vivo with a nucleic acid encoding an agent or a functional fragment of the agent so that the cell expresses the agent or functional fragment; and

b) administering the cell to the mammal,
10 wherein the agent is selected from the group consisting of:

(i) an attractin polypeptide comprising an amino acid sequence selected from the group consisting of
SEQ ID NO:2, SEQ ID NO:10, SEQ ID NO:12, and SEQ ID
15 NO:18;

(ii) a functional fragment of the attractin polypeptide; and

(iii) the polypeptide or the functional fragment, but with one or more conservative amino acid
20 substitutions.

33. An isolated functional attractin fragment comprising amino acid residues 31-104 of SEQ ID NO:12 or
SEQ ID NO:18.

34. An isolated functional attractin fragment
25 comprising amino acid residues 1279-1301 of SEQ ID NO:12.

35. The isolated functional attractin fragment of claim 34, comprising amino acid residues 1219-1429 of SEQ
ID NO:12.

36. An isolated functional attractin fragment
30 comprising amino acid residues 1302-1429 of SEQ ID NO:12.

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37. The method of claim 12, wherein said human is suspected of having common variable immunodeficiency syndrome.

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